INTRODUCING AEQUIVOTAXA:
A NEW CLASSIFICATORY SYSTEM FOR CRYPTOZOOLOGY

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Résumé

Un certain nombre de noms taxonomiques ont été érigés sur la base d'holotypes qui ne sont pas représentés par des onomatophores physiques. On a souvent prétendu que les cryptides, objets des études cryptozoologiques, sont exclus de toute considération nomenclaturale par le Code de l'ICZN de par le fait qu'ils représentent manifestement des concepts hypothétiques. On s'est néanmoins rendu compte que le Code peut être interprété dans un autre sens ; comme on a souvent donné des noms aux cryptides sur la base de descriptions, photographies, dessins etc., cela signifie que, au lieu d'être de simples nomina nuda, ces noms peuvent être techniquement interprétés comme ayant une certaine valeur zoologique. Après une revue systématique et historique des tentatives proposées pour donner des noms aux cryptides, l'auteur propose un nouveau système de classification sous la forme du concept d'aequivotaxa. Ce dernier utilise les évidences plutôt que des spéculations sur l'identité et les affinités des cryptides comme base descriptive de classification. Ce nouveau schéma de classification devrait lever le statut ambigu des noms n'étant pas liés à de spécimens référencés, comme ceux proposés pour les cryptides, ce qui devrait aider à leur appréciation technique, puisque l'on pourrait alors en discuter de manière objective et systématique. [Traduit par la rédaction]

Summury

A number of taxonomic nomina have been granted on the basis of holotypes, which are not represented by physical onomatophores. It is frequently claimed that cryptids, the objects of cryptozoological study, are excluded from nomenclatural consideration by the Code of the ICZN on the basis that they are ostensibly hypothetical concepts. However it has been observed that the Code can be reasonably interpreted in a way that does not support this as cryptids have often been granted nomina on the basis of descriptions, photographs, drawings etc, meaning that rather than simply being nomina nuda, these names can technically be interpreted as having a more ambiguous standing zoologically. After a systematic review of the history of such attempts at granting nomina to cryptids, a new classification system is proposed in the form of the aequivotaxa concept, which employs the properties of the evidence rather than speculations concerning the identities and affinities of cryptids as the descriptive basis for classification. It is proposed that this new classification scheme will resolve the ambiguous standing of non-voucher specimen supported nomina, such as those proposed for cryptids, which will help in facilitating their technical appraisal as they can be discussed in an objective and systematic manner.

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Introduction

There exist a variety of codified rules in zoology and palaeontology governing the assignment of binomial scientific nomenclature to organisms. According to these guidelines, established by the *Code* of the International Commission on Zoological Nomenclature (ICZN), all such names must be supported by the presence of a holotype specimen – ideally a physical voucher specimen of the species (onomatophore) held along with a published description in a public collection, which functions as a reference for all subsequent classification work related to that particular species.[1] However, it has been observed that although the need for a physical specimen to serve as holotype is a *reasonable* interpretation of the *Code*, it is not necessarily a *rigorous* requirement, as nomina (taxonomic names) have indeed been proposed on the basis of drawings, photographs, and detailed eyewitness descriptions.[2 3 4] A problem in current zoology is how to deal with these nomina, especially as they relate to purported "hypothetical concepts" such as cryptids, which are ostensibly excluded from the domain of the *Code*.[5]

According to article 1.3.1 of the *Code*, no proposed nomina shall be considered hoplonyms (nomenclaturally available) if the nomina in question correspond to animals defined as "hypothetical" or not known with certainty to exist or to have existed, except for in the mind of the researcher proposing the nomen.[1] However, as Dubois and Nemésio observe, proposed nomina for species of cryptozoological interest have sometimes been accompanied by "material evidences" in the form of detailed descriptions, photographs, footprints, audio recordings, tissue and hair samples and other traces. This creates an ambiguity zoologically, as irrespective of the validity of the "material evidences" accompanying the proposals, these nomina cannot be excluded on a *prima facie* basis by the *Code*, as they do not in these instances strictly qualify as "known only in the mind of the author whether a prediction or not".[1] The question becomes one of how to interpret the standing of these proposed nomina.[5]

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1 Anon (International Commission on Zoological Nomenclature)*, International Code of Zoological Nomenclature, 4th ed*. London, International Trust for Zoological Nomenclature: 1999.

2 D. Hepell, *Parataxa and hypothetical concepts - their irrelevance to cryptozoology,* Cryptozoology, 2: 1983, pp. 147-154.

3 A. Polaszek, P. Grubb, P, C. Groves, C. L. Ehardt, T. M. Butynski, *What constitutes a proper description?* Science, 39: 2005, pp. 2164-2166

4 A. Wakeham-Dawson, S. Morris, P. Tubbs, *Type specimens: dead or alive?* Bulletin of Zoological Nomenclature*,* 59: 2002, pp. 282-284.

5 A. Dubois, A. Nemésio, (2007). *Does nomenclatural availability of nomina of new species or subspecies require the deposition of vouchers in collections?* Zootaxa, 1409: 2007, pp. 1-22.

The ichnological example

Palaeontologists were amongst the first to recognize the need for a new nomenclature for describing organismal traces. Material evidence of an organism is ostensibly present in these cases, but the capacity to exactly diagnose the organism is typically lacking.[6]

A notable event occurred in 1957, when palaeontologists Raymond More and Peter Sylvester-Bradley proposed to the ICZN that the disarticulated remains of fossils should be classified under the mantle of 'parataxa', as it was suggested that such fossil traces were useful in parasitology, where the morphology of a species of parasite at one life stage may be unpredictably different from that of its final life stage, and also in biostratigraphy, where fossil fragments have chronometric value.[7] The proposal was rejected by the ICZN in 1958,[8] however the debate concerning the utility of parataxa is still largely unresolved.[6 9] A related concept is ichnotaxonomy, which has established its own rules concerning the naming of form fossils, coprolites, burrows, etchings and other trace fossils. An ichnotaxon is described by the ICZN as a taxon based on the preserved work of an organism.[1] Within ichnology - the study of both ancient and modern traces of organismal behaviour, a classification scheme has been developed which in many respects parallels the system developed for whole organisms ('species', 'genus', and 'family' ranks are assigned to ichnotaxa as ichnospecies, ichnogenus and ichnofamily respectively), but differs significantly, as in the absence of complete knowledge concerning an organism, the ichnological classification system groups traces based upon ethologic affinities rather than on the morphological and genetic affinities which form the basis of conventional organismal classification systems. Another key way in which these classification schemes differ is that researchers tend only to classify trace fossils up to the rank of ichnofamily, although there have been controversial proposals to expand the hierarchy to include ranks as high as ichnosuperorder and ichnoinfraclass (for examples see http://www.Paleofile.com, an online database of Paleozoic and Mesozoic tetrapods).

Proposing a new classification concept

Cryptozoology encompasses a set of targeted research methodologies designed to elucidate the identities of organisms known either directly but anecdotally (i.e. through verbal and written descriptions) and indirectly (i.e. through legend, folklore, ancient depictions etc).[10 11] The principle objects of cryptozoological research are cryptids, which represent combinations

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6 A. P. Rasnitsyn, *Conceptual issues in phylogeny, taxonomy, and nomenclature. Contributions to Zoology,* 66: 1996, pp. 3-41.

7 R. C. Moore, P. C. Sylvester-Bradley, *Taxonomy and nomenclature of Aptychi.* In: R. C. Moore, Treatise on invertebrate paleontology, volume L, mollusca 4, cephalopoda, ammonoidea, Kansas, Geological Society of America and University of Kansas Press, 1957, L465-L471.

8 G. G. Simpson, *Mammals and cryptozoology.* Proceedings of the American Philosophical Society, 128: 1984, pp. 1-19.

9 S. Bengtson, *Taxonomy of disarticulated fossils.* Journal of Palaeontology, 59: 1985, pp. 1350-1358.

10 C. Arment, *Cryptozoology: Science and Speculation.* Philadelphia, Coachwhip Publications: 2004.

11 J. R. Greenwell, *A classificatory system for cryptozoology.* Cryptozoology, 4: 1985, pp. 1-14.

of various evidences with hypotheses concerning affinities, habits etc.[12] The key difference between a cryptid and a known species is that for the former there exists only ethnoknowledge – i.e. *some* kind of human knowledge *prior* to full scientific discovery and description.[11 13] Independent of cryptids, anecdotal but direct evidence of unknown organisms (such as sightings reports) has been shown to have scientific validity in that it can be used to test/falsify conservatively constructed hypotheses.[14] Bernard Heuvelmans, considered by many as the founder of cryptozoology, regarded the ICZN's 1958 rejection of the Moore and Sylvester-Bradley proposal as a potentially serious setback to the field, owing to the fact that he saw a variant of the parataxa concept as being the basis upon which organisms that were ethnoknown might be granted binomial names, and therefore accorded some zoological legitimacy.[13] It has been suggested however that Heuvelmans was labouring under a misapprehension, as at the time there was no rigorous requirement in the *Code* for an onomatophore to accompany a description of a new taxon.[2 15]

Despite the perceived 'set back', Heuvelmans and others were quite liberal in ascribing binomial names to cryptids; a practice that has been criticized by both mainstream zoologists and cryptozoologists alike, who have variously suggested that such names should be ignored as anoplonyms or *nomina nuda* (nomenclaturally unavailable) in the absence of physical holotype specimens,[8 16 17] or that a naming protocol is simply irrelevant to cryptozoology.[2] As was mentioned previously, the proliferation of these nomina, especially as they pertain to 'hypothetical concepts' has created a problem for the *Code*, which must treat them as having ambiguous rather than no taxonomic standing.[5] Whilst Heuvelmans was obviously unaware of the vagaries of the *Code*, his argument that through the use of binomials cryptids could be accorded some legitimacy deserves to be taken seriously. The existence of a regulated system for granting binomials in cryptozoology could theoretically be an enormous asset to the field, as it would permit cryptids and their accompanying evidences to be dealt with rationally and in an ordered and systematic manner as opposed to the haphazard way in which they are typically dealt by both proponents and critics of the field. The existence of such a system would also encourage the coherence of knowledge within the field, which is essential for the establishment of cryptozoology as a formal discipline. Such a system would furthermore resolve the current contradictions in the *Code*, as if the system were to operate in parallel with the *Code*, the wording of articles 16.4 through 16.4.3 need not be amended so as to explicitly require a physical onomataphore to function as the holotype as Dubois and Nemésio[5] have suggested. This alternative might therefore mitigate the concerns of those who see such a

12 M. A. Woodley, *The case for cryptids*. Fortean Times, FT69: 2010, p. 55.

13 B. Heuvelmans, *What is cryptozoology?* Cryptozoology, 1: 1982, pp. 1-12.

14 C. G. M. Paxton, (2009). *The plural of 'anecdote' can be 'data': statistical analysis of viewing distances in reports of unidentified large marine animals 1758-2000*. Journal of Zoology, 279: 2009, pp. 381-387.

15 O. Pauwels, F. Chréot, *Cryptoherpétologie et nomenclature: le probléme et sa solution.* Bulletin de la Société Herpétologique de France, 82-83: 1998, pp. 41–49.

16 A. M. Bauer, A. P. Russell, *A living plesiosaur?: a critical assessment of the description of Cadborosaurus willsi* Cryptozoology, 12: 1996, pp. 1-18.

17 D.Naish, *Sea serpents, seals and coelacanths: an attempt at a holistic approach to the identity of a large aquatic cryptids.* Fortean Studies, 7:2001, pp. 75-94

rewording as having negative consequences for the conservation of rare species,[18] a concern that is of particular relevance to cryptozoology as species that are only ethnoknown must in many instances be sufficiently rare so as to have successfully evaded formal collection.[19] [20] A classification system in which nomina are granted on the basis of forms of evidence insufficient to permit exact organismal diagnosis is not without precedent, the aforementioned ichnology being a pertinent example. The objective of this article is therefore to propose a classification system for cryptozoology in the form of the *aequivotaxa* concept (from the Latin *aequivocus* meaning equivocal or of uncertain nature or classification). This classification system will be presented in full after a systematic review of the various attempts at assigning binomial names to cryptids, from which nomina considered potentially hoplonyms (nomenclaturally available by the rules of aequivology) will be identified and tabulated.

A review of attempts at naming hominological cryptids

A variety of nomina have been proposed over the years for the hominological cryptids (Sasquatch, Yeti, Alma etc). Many of these names have been reviewed previously,[21] [22] however here they shall be reviewed more comprehensively, taking into account recent developments, such as anthropologist D. Jeffrey Meldrum's recently published ichnotaxon for Sasquatch tracks.

De Loys' ape

An early instance of a hominological cryptid being ascribed a nomen was in the case of the so-called De Loys' Ape. The creature that was said to resemble a large (four feet tall), tailless, bipedal spider monkey was reputedly encountered in 1920 by Swiss Geologist François De Loys along the border between Colombia and Venezuela. He and his party, which had been reduced in number from 20 to four due to a combination of disease and conflict with native peoples, claimed that whilst camped in the Tarra river region, they were approached by two of these creatures, which were behaving aggressively. De Loys then claimed that one (identified as a female) was shot as a protective measure. The creature was then propped in an upright position on a box using a stick under its chin and the now famous photograph was taken. It was claimed that the animals hide and skull had also been collected, in addition to more photographs, however these were subsequently lost to science. De Loys mentioned nothing of his encounter until 1929, when his colleague, the anthropologist George Montandon came across the photograph whilst browsing De Loys' files for information on South American

18 T. M. Donegan, *New species and subspecies suggestions do not and should not always require a dead type specimen*. Zootaxa, 1761: 2008, pp. 37-48.

19 P. F. Brussard, *The likelihood of persistence of small populations of large animals and its implications for cryptozoology*. Cryptozoology, 5: 1986, pp. 38-46.

20 D. C. Guynn, R. L. Downing, G. R. Askew, *Estimating the probability of non-detection of low density populations.* Cryptozoology, 4: 1985, pp. 55-60.

21 G. S. Krantz, *Big Footprints: A Scientific Inquiry Into the Reality of Sasquatch***.** Boulder, Johnson Books: 1992.

22 L. Coleman, *Scientific names for bigfoot,* 1997, http://www.cryptomundo.com/cryptozoo-news/squ-sci-names/

tribes. De Loys released a full description of his encounter to the *Illustrated London News* on June 15th 1929,[23] which was followed in rapid succession by a series of scientific articles by Montandon in which, based on the photograph, a nomen honouring De Loys was proposed for the cryptid in the form of *Ameranthropoides loysi.*[24] [25] The claim was highly controversial at the time attracting considerable criticism of fraud, most notably from the anthropologist Sir Arthur Keith, who argued that the find was little more than a spider monkey prepared in such a way so as to make it look like something zoologically novel.[26]

Neanderthaloid wildmen

In 1955, Heuvelmans suggested that the Yeti be granted the name of *Dinanthropoides nivalis* – literally 'The terrible anthropoid of the snows'.[27] He also initially proposed that the cryptids described as Neanderthaloid wildmen (Such as the Siberian Almas and the Chinese Yeren) should be named *Homo pongoides*;[28] arriving at this conclusion after co-examining the famed Minnesota Iceman with Ivan Sanderson. An earlier nomen in the form of *Primihomo asiaticus* dating back to 1914 had been previously proposed by the naturalist Vitaly A. Khakhlov for the *Ksy-Gyik* – wildmen living in the mountainous regions of Kazakhstan, Kyrgyzstan and China.[29] Heuvelmans subsequently demoted the wildman to the status of subspecies - *Homo neanderthalensis pongoides,* after collaboration with the Soviet ethnographer and historian Boris Porshnev.[30] Porshnev had previously suggested that surviving Neanderthaloid wildmen be designated as *Troglodytes recens.* [31] [32] In an article published in *Current Anthropology*, Porshnev declared his objective to rewrite the postulates of primatology and anthropology through his theory that modern Humans had one immediate ancestor in the form of *Paleanthropus* (*Troglodytes fossilis*), representatives of which survive into the modern era as

23 F. De loys, *A gap filled in the pedigree of man? A sensational discovery in South America: a new and strangely human species of the anthropoid apes (hitherto unknown in the Western hemisphere).* The Illustrated London News, 174: 1929, p.1040.

24 G. Montandon, *Découvertes d'un singe d'apparence anthropoide en Amérique du Sud.* Journal de la Société de Américanistes de Paris, 21: 1929, pp. 183-195.

25 G. Montandon, *Un singe d'apparence anthropoïde en Amérique du Sud*. Comptes Rendus Hebdomadaires des Seances de l'Académie des Sciences (Paris), 188: 1929, pp. 815-817.

26 A. Keith, *The alleged discovery of an anthropoid ape in South America.* Man, 29: 1929, pp. 135-136.

27 B. Heuvelmans, *Sur la Piste des Bêtes Ignorées.* Paris, Libraire Plon: 1955.

28 B. Heuvelmans, *Note préliminaire sur un spécimen conservé dans la glace, d'une forme encore inconnue d'hominidé vivant: Homo pongoides (sp. seu subsp. nov.).* Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, 45: 1969, pp. 1–24.

29 V. A. Khakhlov, *On the "wild men" in Central Asia (in Russian).* In: B. Porshnev, A. Shmakov, Information materials of the commission for the study of the "snowman" question. Vol. 4, Moscow, 1959, pp. 13-105.

30 B. Heuvelmans, B. F. Porshnev, *L'homme de Néanderthal est toujours vivant.* Paris, Libraire Plon: 1974.

31 B. F. Porshnev, *The Present State of the Problem of Relic Hominoids* (in Russian). Moscow, Viniti: 1963.

32 B. F. Porshnev, *The problem of relic Paleanthropus* (in Russian).Sovetskaya Etnografia, 2: 1969, pp 115-30

the wildmen.[33] Perhaps unsurprisingly, the radical conclusions to which his article came attracted much in the way of criticism within anthropological circles at the time.[8] Linguist Yöngsiyebü Rinchen[34] has suggested that the Almas might be a novel human subspecies, which he informally christened *Homo sapiens almas*.

Sasquatch

The pioneering anthropologist Grover Krantz long maintained that the Sasquatch represents a relict population of *Gigantopithecus blacki*, and that no new scientific nomenclature would in theory be required upon their discovery.[35] However, Krantz was prepared for the possibility that the Sasquatch could turn out to be a new species or even a new genus. In the event of the former, Krantz proposed that it be called *Gigantopithecus canadensis*[21] ('canadensis' is a name commonly assigned to species native to North America). In the event of the latter, he suggested using the genus nomen *Gigantanthropus*, after anthropologist Franz Weidenreich's[36] proposed alternative to *Gigantopithecus,* which was subsequently never formally used.

Krantz even contemplated the possibility that the Sasquatch might be wholly unrelated to the gigantopithecines, being instead related of the australopithecines, in which case he proposed the use of *Australopithecus robustus* in the event that they turned out to be relict populations of the hominid and *Australopithecus canadensis* in the event that they turned out to be a novel species within the genus,[21] although in this regard Krantz was predated by anthropologist Gordon Strasenburgh, who in 1971 (and again in 1975), suspecting a robust australopithecine-Sasquatch affinity based on observations of what appear to be sagittal crests in the animals, suggested the nomen *Paranthropus eldurrelli* specifically for populations native to the Pacific Northwest.[37]

It is interesting to note that Krantz proposed assigning the nomen *Gigantopithecus blacki* to a type specimen represented by three Sasquatch footprint casts found in 1982.[38] This was of course inadmissible under the ICZN's rules governing taxonomic nomenclature for two reasons. Firstly the track maker and the track are biotaxon and ichnotaxon respectively, which means that the track maker can not have the same name as the track. Geologist Martin Lockley observed that one way in which Krantz could potentially have resolved this would

33 B. F. Porshnev, *The troglodytidae and the hominidae in the taxonomy and evolution of higher primates.* Current Anthropology, 15: 1974, pp. 449-450.

34 T. Halbertsma, *Mongolia's Homo sapiens almas: a tale of two skulls, two hairs and two reconstructions.* Kraken: Archives of Cryptozoology, 2: 2009, pp. 41-57.

35 G. S. Krantz, *A species named from footprints*. Northwest Anthropological Research Notes, 19: 1986, pp. 93-99.

36 F. Weidenreich, *Giant early man from Java and South China.* Anthropological Papers of the American Museum of Natural History, 40: 1945: pp. 1-134.

37 G. Strasenburgh, *On Paranthropus and "relic hominoids".* Current Anthropology, 16: 1975, pp. 486-487.

38 G. S. Krantz, *Anatomy and dermatoglyphics of three Sasquatch footprints.* Cryptozoology, 2: 1983, pp. 53-81.

have been in the selection of a novel ichnotaxon name like *Gigantopithepodus.*[39] Secondly, extant organismal traces are not regulated by the *Code* if established after 1930 (Art. 1.3.6), so strictly speaking, no such nomina can be recognized by the ICZN. Meldrum has recently published a formal description of Sasquatch footprints using molds and casts reposited at National Museum of Natural History, Smithsonian Institution and the Titmus Collection at the Willow Creek China Flats Museum, California. He proposes that these traces be termed *Anthropoidipes ameriborealis* ("North American ape foot"),[40] however as the nomen is based on recently made tracks rather than on fossil traces it cannot be recognized under the auspices of the *Code*.

Others

The skunk ape is a hominological cryptid said to inhabit the forests of the American Southeast. It derives its name from the odour that is said to accompany sightings. Cryptozoologist Loren Coleman has proposed that the skunk ape should be assigned to the extinct ape genus *Dryopithecus,* which disappeared nine million years ago.[22] Cryptozoologist Mark Hall has suggested the nomen *Homo gardarensis* to describe a category of Sasquatch-like hominological cryptids that he terms 'Trolls'. The nomen was originally used mistakenly to describe unusual humanoid remains found in a 12th century Viking burial site, which subsequently turned out to those of an individual with acromegaly. Hall however contests these findings, maintaining that the remains are in fact those of a hominological cryptid.[41]

A review of attempts at naming dracontological cryptids

Even though attempts at naming dracontological cryptids (sea serpents, lake monsters etc) predate equivalent efforts in hominology, by comparison, such work has largely gone undocumented. There exist no reviews of the history of efforts to derive such nomina, a fact made all the more remarkable by the provenance of some of these proposed names and in the passionate debate stirred by others, such as in the case of the formal description of the *'Cadborosaurus'*.

Marine cryptids

The earliest attempt at assigning a nomen to a sea serpent occurred in 1809, when a globster (an ambiguous carcass in an advanced state of putrefaction) washed up on the shores of the Isle of Stronsa, Scotland. Drawings made at the time depict the carcass as possessing a long neck, long tail and six legs. In the excitement that followed its discovery, naturalist

39 M. Lockley, *The Eternal Trail: A Tracker Looks at Evolution.* Reading, Perseus Books: 1999.

40 D. J. Meldrum, *Ichnotaxonomy of giant homonoid tracks in North America*, In: S. G. Lucas, J. A. Spielmann, M. Lockley, Cenzoic vertebrate tracks and traces. New Mexico museum of science and natural history bulletin, 45, 2007, pp. 225-231.

41 M. A. Hall, *The real Bigfoot and genuine Bigfoot tracks*. Wonders, 7: 2002, pp. 99-125.

Patric Niell proposed that it be granted the nomen *Halsydrus pontoppidani*.[42] Upon analysis of preserved samples taken from the carcass however, it turned out to be little more than a basking shark,[43] albeit one of unusually great length (55 feet). In 1817, the Linnaean Society of New England christened an unusual small black snake, presented to them by a local man, *Scoliophis atlanticus*. It was concluded by a committee that the specimen represented the juvenile form of a sea serpent that had frequently been seen off of the coast of New England, and which had caused quite a sensation within zoological circles at the time. It was additionally suggested that *Scoliophis* had strong morphological affinities with the common black snake (*Coluber constrictor*), a species native to New England, which confirmed in their minds that the sea serpent was in fact a species of snake. The specimen was meticulously described and illustrated, complete with anatomical details in the societies *Transactions*, it was further elaborated upon in a subsequent report,[44] which was reviewed by the French naturalist Henri-Marie Ducrotay de Blainville, who thought that the case for connecting the *Scoliophis* specimen with the New England sea serpent was extremely weak.[45] The report eventually came to the attention of another French naturalist, Charles Lesueur, who upon dissecting a sample from the specimen concluded that it was in fact little more than a deformed common black snake.[46]

The naturalist Constantine Samuel Rafinesque-Schmaltz published a crude taxonomy of sea serpent nomina in 1819, based partly upon the use of characteristics culled from sightings as a means of diagnosing potential taxonomic affinities. Rafinesque-Schmaltz concluded that sea serpents could be loosely divided into two categories – those that were allied with the sea snakes and those that were allied with the eels. Within the former category, he included two species; *Megophias monstrosus* (or *Pelamis megophias*) ('Giant snake'), which was purported to be a 100-foot long, denizen of the waters of New England, and a possible ally of the sea snake genus *Pelamis* (hence the proposed synonym); and *Pelamis chloronotis*, which was purported to live off the coast of Newfoundland and was said to be even larger, at 200 feet, with a green back, "flexuous hillocks" and an alleged capacity to generate considerable noise.

Within the eel allied category, Rafinesque-Schmaltz again suggested two new nomina – the first being *Octipos bicolor*, a 60-foot, horse headed, long necked synbranchid, allegedly native to the Irish coast; and the second - tentatively given the nomen *Octipos (?) coccineus*, which was purported to be 40-feet in length, with an "acute" head and crimson coloration. It was

42 Anon (Wernerian Natural History Society), *Proceedings of the meeting of the Wernerian Natural History Society.* Philosophical Magazine, 33: 1809, p. 90.

43 B. Heuvelmans, *Le Grand-Serpent-de-Mer, le problème zoologique et sa solution*. Paris, Libraire Plon: 1965.

44 Anon (Committee of the Linnean Society of New England), *Report of a Committee of the Linnaean Society of New England Relative to a Large Marine Animal Supposed to be a Serpent, seen near Cape Ann, Massachusetts, in August 1817.* Boston, Cummings and Hilliard: 1817.

45 H-M. Ducrotay de Blainville, *Sur un nouveau genre de serpent,Scoliophis, et le serpent-de-mer vu en Amérique en 1817.* Journal de Physique, de Chimie et d'Histoire Naturelle, 86: 1818, pp. 297-304.

46 C. A. Lesueur, *Sur le serpent nommé Scoliophis: extrait d'une letter addressee au rédacteur [H-M. Ducrotay de Blainville].* Journal de Physique, de Chimie et d'Histoire naturelle, 86: 1818, pp. 466-469.

based off of a single sighting made in the mid-Atlantic.[47] The next instance a new nomen was to be proposed for a sea serpent was in the case of *Hydragos sillimani* ('Silliman's master of the seas'), which was the name given by showman Albert Koch, in 1845 to a skeleton that he claimed represented an extinct marine super-serpent.[48] It transpired that the *Hydragos* skeleton, which Koch had exhibited in New York, was comprised of remains sourced from five different basilosaur specimens, which had been assembled incorrectly. The fraud was uncovered by anatomist Jeffries Wyman, who proposed that it be renamed *Hydrarchos sillimani,* and that this nomen be made a subjective synonym for *Zeuglodon ceti.*[49] The original nomen was given in honour of the chemist Benjamin Silliman, who upon learning of Koch's hoax, demanded that his name be removed from the nomen. Koch however continued exhibiting the remains in Europe using the new nomen *Hydrarchos harlani.*[50] In 1892, Dutch Zoologist Anthonid Cornelis Oudemans produced an exhaustive treatise on the sea serpent phenomenon entitled *The Great Sea-Serpent.* In essence he believed that all authentic sea serpent sightings could be attributed to a single undiscovered marine animal, which exhibited a mixture of lutrinae (otter), pinniped (seal) and cetacean (whale) characteristics. He proposed that it be assigned the nomen *Megophias megophias.*[51] Oudemans had earlier proposed that the 'great sea serpent' was in fact a species of the genus *Zeuglodon*, and had suggested the nomen *Zeuglodon plesiosauroides,*[52] however in his treatise, he proposed making his earlier nomen along with all of Rafinesque-Schmaltz's proposed nomina synonymous with *Megophias megophias.*[50]

The nomen *Chelosauria lovelli* ('Lovell's tortoise-lizard') was proposed in 1893 for the Moha Moha, a marine cryptid described as a cross between a long-necked turtle and a fish resident to the coastal waters of Queensland, Australia. The nomen was originally proposed by the naturalist William Saville-Kent, assistant curator of the British Museum (Natural History) in honour of one Miss S. Lovell, a schoolteacher who had previously communicated a description of the cryptid to the journal *Land and Water* in 1890.[53]

In the early 30's, naturalist William Beebe observed an unusual fish at a depth of 1,900 feet in a bathysphere off the coast of Bermuda. This 'five-lined constellation fish' (so called because of the patterns present on its body) was given the nomina *Bathysidus pentagrammus* by Beebe in 1934,[54] and has not been observed since. In his book, *Le Grand-Serpent-de-Mer*

47 C. S. Rafinesque-Schmaltz, *Dissertation on water-snakes, sea snakes, and sea serpents.* The Philosophical Magazine & Journal, 54: 1819, pp. 361-367.

48 A. C. Koch, *Hydrargos or Great Sea-Serpent, of Alabama.* New York, B. Owen: 1845.

49 J. Wyman, *Communication on skeleton of Hydrarchos sillimani* Proceedings of the Boston Society of Natural History, 2: 1845, pp. 65-68

50 A. C. Koch, *Description of the Hydrarchos harlani: (Koch), a Gigantic Fossil Reptile.* 2d ed. New York, B. Owen: 1845.

51 A. C. Oudemans, *The Great Sea-Serpent: An Historical and Critical Treatise.* London, Luzac and Co: 1892.

52 A. C. Oudemans, *Iets over fabelachtige verhalen en over het vermoedelijk bestaan van de groot zeeslang.* Album der Natur, 1881, pp.13-26.

53 SW. Saville-Kent, *The Great Barrier Reef of Australia; its Products and Potentialities.* London, W. H. Allen & Co: 1893.

54 W. Beebe, *Half Mile Down.* New York, Harcourt Books: 1934.

(published first in French in 1965 and in English in 1968 as *In the Wake of the Sea-Serpents*) Heuvelmans famously proposed a collection of nomina for a number of the novel diagnoses that he made concerning the taxonomic affinities of unknown marine cryptids, derived from comparative analyses of several hundred witness reports. The cryptid types that Heuvelmans names fall into his pinniped and archaeocete (primitive whale) categories; within the former category he includes *Megalotaria longicollis*, a 15-60 foot long, cosmopolitan, euryhaline (fresh and salt water tolerant) long necked otariid (sea lion), and *Halshippus olaimagni* (Heuvelmans incorrectly transcribed this nomen as *Halshippus olai-magni* – the *Code* does not permit hyphenation in the naming of taxa, see Art. 32.5.2.3), a 15-100 foot long, cosmopolitan, horse headed, long necked pinniped of unknown familial affinity, exhibiting abyssal adaptations.[43]

The nomina that Heuvelmans generated for his contemporary representatives of the Archaeoceti will be discussed in detail in the next section. In 1995, a cryptozoological paper co-authored by oceanographer Paul LeBlond and marine biologist Edward Bousfield attracted attention when it appeared in the peer-reviewed journal *Amphipacifica*. The paper purported to provide the first formal description of a cryptid known as 'Caddy', which is thought to reside in the coastal waters of British Columbia. They chose the nomen *Cadborosaurus willsi* in honour of the journalist Archie Wills and diagnosed it as a contemporary sauropterygian plesiosaur partly through the use of a specially developed vertebrate classification index, and also on the basis of some old photographs which had been unearthed depicting an alleged 'Caddy' specimen that had been recovered from the stomach contents of a whale in 1937. The specimen depicted in the photographs was used in this instance as the holotype for their claim in substitution for an onomatophore (the carcass in the photographs is currently lost to science).[55]

The paper generated much in the way of criticism, which tended to focus on two main issues; firstly, the diagnosis of the carcass in the photographs as a contemporary plesiosaur has been challenged on the grounds that LeBlond and Bousfield made errors and failed to adequately consult the plesiosaur literature with the balance of evidence seeming to suggest a mammalian rather than a reptilian identity for 'Caddy'[56] [57], also the nomen has been challenged on the grounds that specimens depicted in photographs do not constitute a satisfactory holotype.[16] [58] A more recent alternative nomen has been proposed for 'Caddy' by cryptozoologist Pasquale Saggese who has suggested *Cadborotherium willsi* on the basis of a belief that the cryptid possesses mammalian, specifically sirenian affinities.[59]

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55 E. L. Bousfield, P. H. LeBlond, (1995*). An account of Cadborosaurus willsi, new genus, new species, a large aquatic reptile from the Pacific coast of North America*. Amphipacifica, 1: 1995, pp. 1-25.

56 D. Naish, *Sea monsters and the 'prehistoric survivor paradigm'*. Poster presented at the 9th European Symposium of Cryptozoology, Engreux, Belgium: 2010.

57 M. A. Woodley, D. Naish, H. P. Shanahan, *How many extant pinniped species remain to be described?* Historical Biology, 20: 2008, pp. 225-235.

58 C. P. Staude, P. Lambert, *Editorial… an opposing view.* Amphipacifica, 1 (Supp): 1995, p. 2.

59 P. Saggese,Cadborosaurus willsi *attributive inquiry*. Bipedia, 24: 2006, pp. 50-68.

Cryptocetacea

Over the centuries a handful of apparently non-misidentified and non-teratological cetacean species have been observed possessing characteristics that are not present in any of the species currently known to zoology. These have been termed cryptocetaceans by tetrapod zoologist Darren Naish, and are studied within the sub-branch of dracontology known as cryptocetology.[60] [61]

In a few instances, the observers of these cryptids have suggested nomina for them. The first such instance occurred in 1692, when the Scottish physician and antiquary Sir Robert Sibbald described a pair of unusual sperm whales beached in the Shetland Islands. These whales possessed tall dorsal fins, a characteristic unknown in the genus *Physeter.*[62] In 1758, naturalist Carolus Linnaeus included Sibbald's suggested nomen for the cryptid *Physeter tursio* ('sperm whale dolphin'), in the tenth edition of his *Systema Naturae*,[63] which is currently considered a subjective synonym for *Physeter catodon*, the common sperm whale.

In 1814, Rafinesque-Schmaltz coined *Oxypterus mongitori* for a double dorsal finned 'monsterous fish', which was reported as having been stranded on a Sicilian beach by the naturalist Antonino Mongitore. He believed it to have been a cetacean.[64] Subsequent scrutiny of the reports indicated however that the alleged cetacean was in all likelihood a shark[65]. Rafinesque-Schmaltz also coined the nomen *Epiodon uruganantus* for another cryptid whale, which was described as lacking a dorsal fin in addition to lower teeth. Its upper jaw was described as protruding forward considerably beyond the lower.[64] Naturalist Anselme Gaëtan Desmarest subsequently suggest that it be reclassified as *Delphinus epiodon.*[66] Although formerly listed as *nomen dubiem*, zoologists have tended to regard these nomina as distorted descriptions of the goose-beaked whale *Ziphius cavirostris.*[67] In 1819 the French naturalists Jean-René Quoy and Joseph Gaimard, whilst in the Pacific, observed a large pod of unidentified double dorsal finned dolphins. These "rhinoceros dolphins" were given the nomen *Delphinus rhinoceros.*[68] More recently, cryptozoologist Michel Raynal and marine biologist Jean-Pierre Sylvestre have suggested the alternative nomen *Cetodipterus rhinoceros.*[65]

The Italian naturalist Enrico Giglioli observed yet another double finned cetacean in 1867 whilst in the South East Pacific. This cetacean, which was described as resembling a Blue

60 D. Naish, *Cryptocetology; introducing a new branch of cryptozoology.* Animals & Men, 7: 1995, pp. 19-27

61 M. Raynal, *Cryptocetology and mathematics: how many cetaceans remain to be discovered.* Crypto (Dracontology special), 1: 2001, pp. 93-112.

62 R. Sibbald, *Phalainologia Nova Siva Observationes de Rarioribus Quibusdam Balaenis Littus Nuper Ejectis, etc.*Edinburgh, 1629

63 C. Linnaeus, *Systema Naturae per Regna Tria Naturae.* 10th ed., Holmiae, Impensis Laurentii Salvii: 1758.

64 C. S. Rafinesque-Schmaltz, *Précis des Découvertes et Travaux Somiologiques de C. S. Rafinesque Schmaltz entre 1800 et 1814.* Palermo, Royale Typographie Militaire: 1814

65 M. Raynal, J-P. Sylvestre, *Cetaceans with two dorsal fins.* Aquatic Mammals, 17: 1991, pp. 31-36.

66 A. G. Desmarest, *Mamiferes*. 1822, pp. 512-516.

67 G. Cuvier, *Le Règne Animal, Distribué d'Après son Organisation, pour Servir de Base à l'Histoire Naturelle des Animaux et d'Introduction à l'Anatomie Comparée.* 2nd edition (v. 2): Paris, Chez Déterville: De l'imprimerie de A. Belin: 1829.

68 J-R. C. Quoy, J. P. Gaimard, *Voyage Autour du Monde Exécuté sue les Corvettes de S.M. l'Uranie et la Physicienne Pendant les Années 1817, 1818, 1819 et 1820.* Paris, Pillet Aîné: 1824.

whale, possessed two dorsal fins separated by over two meters, and seemed to lack gular and ventral ridges. These characteristics were thought indicative of a new species rather than a teratological variant, to which Giglioli gave the nomen *Amphiptera pacifica* ('the one from the Pacific with a fin on each side').[69] [70] [71]

Within Heuvelmans' archaeocete category, he included *Plurigibbosus novaeangliae* (again incorrectly transcribed by Heuvelmans as *Plurigibbosus novae-angliae*) a 60-100 foot long archaeocete which possesses a series of static humps along its back and was proposed as the culprit behind the New England sea serpent sightings of the early 19th century; *Hyperhydra egedei*, an otter-like, 65-100 feet long, probable primitive archaeocete exhibiting amphibian adaptations and an exclusively Arctic distribution (in 1996 cryptozoologist Lars Thomas proposed that it should be renamed *Hyperhydra norvegica)* [72] ; and finally, *Cetioscolpendra aeliani*, a 60-79 foot long armoured archaeocete native to the waters of the tropics.[43] In his 2008 revision of Heuvelmans' marine cryptid identity theories, this author proposed that Heuvelmans' *Cetioscolpendra* should be given a new nomen in the form of *Mariascolpendra aeliani*, as the case for it being an archaeocete has all but collapsed in recent years.[73] It has been proposed instead, based on historical descriptions of specimens, that if it exists, it is more likely to be a large invertebrate.[74]

Giant cephalopods

Zoologist Addison Verrill, who formally described the giant squid (*Architeuthis dux*), proposed that what was originally thought to be the carcass of a gigantic octopus (which washed up on the shores of St. Augustine, Florida in 1896) should be granted the nomen *Octopus giganteus.*[75] Later that year he would retract this claim as he came to believe that the carcass was of cetacean origin.[76] The carcass, a classic 'globster', subsequently became the centre of a controversy which lasted from 1971 to 2004, during which time old photos presumed lost resurfaced and tissue samples were located at the Smithsonian museum. In 1971, zoologist Joseph Gennaro obtained samples and concluded based on a microscopic analysis

69 E. H. Giglioli, *Note Intomo Alla Distribuzione Della Fauna Vertebrata Nell'Oceano Prese Durante un Viaggio Intorno al Globo, 1865-1868*. Firenze, Giuseppe Civelli: 1870.

70 E. H. Giglioli, *I Cetacei Osservanti Durante il Viaggio Intorno al Globo Della R. Pirocorvetta Magenta, 1865-1868*. Napoli, Stamperia della Regia Universita: 1874.

71 E. H. Giglioli, *Viaggio Intorno al Globo Della R.P. Italiana Magenta Negli Anni 1865-66-67-68.* V. Milano, Maisner e Co: 1875.

72 L.Thomas, Appendix: *No super-otter after all?* Fortean Studies, 3: 1996, pp.234-236

73 K. P. N. Shuker, *The Beasts That Hide From Man: Seeking the World's Last Undiscovered Animals.* New York, Paraview Press: 2003.

74 M. A. Woodley, *In the Wake of Bernard Heuvelmans: An Introduction to the History and Future of Sea Serpent Classification*. Bideford, Centre for Fortean Zoology Press: 2008.

75 A. E. Verrill, *Additional information concerning the giant cephalopod of Florida,* American Journal of Science (4th series), 3:1897, pp. 162-163.

76 A. E. Verrill, *The supposed great octopus of Florida; certainly not a cephalopod,* American Journal of Science (4th series), 3:1897, pp. 355-356.

of the striation patterns that they belonged to a new species of octopus with an estimated total spread of 200 feet.[77] This conclusion was reinforced by the 1986 findings of biochemist and cryptozoologist Roy Mackal who, based on a comparative biochemical analysis of the amino acid composition in the samples, concluded that they had indeed originated from an octopus.[78] Two subsequent biochemical analyses were to challenge these findings however and lend support to Verrill's conclusion that the carcass was in fact the remains of a cetacean in an advanced state of putrefaction.[79] [80] [81] In 1987, Raynal suggested the alternative generic name (whilst retaining Verill's original species name) in the form of *Otoctopus giganteus* ('giant eared octopus').[82]

Fresh water cryptids

In comparison to the marine cryptids, there has been far less interest in assigning nomia to the fresh water variety. The earliest such nomina is *Ompax spatuloides*, which was coined in 1879 for a peculiar, duck-billed fish, said to be poisonous, eaten by naturalist Carl Staiger whilst staying in Gayndah station, Queensland in 1872. Staiger sent drawings of the fish to the naturalist François Louis de la Porte, Comte de Castelnau, who coined the nomen.[83] It subsequently transpired that the fish was a hoax perpetrated by locals, who prepared the 'fish' from the body of a mullet, the tail of an eel and the head of either a platypus or a needlefish. Despite the fact that it was revealed as a hoax, the nomen continued to appear on some lists of Australian fishes until the 1930's.[84] Two nomina have been proposed for the Loch Ness monster. In 1961, Loch Ness investigator Peter O'Connor of the northern naturalists association proposed that it be called *Nessiesaurus o'connori* ('The Ness reptile of O'Connor') based on a photograph taken in 1960.[85] The naturalist Sir Peter Scott and the polymath Robert Rines, who produced a series of controversial photographs purporting to show the head and fin of a 'Nessie', also suggested that the monster be given the nomen *Nessiteras rhombopteryx* ('The Ness monster with diamond-shaped fin') in order to have it placed on the British register of officially protected wildlife.[86] It was soon pointed out by the Scottish politician Nicholas Fairbairn, however that the proposed nomen was in fact an anagram of "Monster Hoax by Sir Peter S", to which Rines countered with the observation that it was also an

77 J. F. Gennaro Jr. *An octopus trilogy. Part 2. The creature revealed*. Natural History, 80:1971, pp. 24, 84.

78 R. P. Mackal, *Biochemical analyses of preserved Octopus giganteus tissue.* Cryptozoology, 5:1986, pp. 55-62.

79 S. Pierce, G. Smith, T. Maugel, E. Clark, (1995). *On the giant octopus (Octopus giganteus) and the Bermuda blob: homage to A. E. Verrill***.** Biological Bulletin, 188:1995 pp. 219-230.

80 S. Pierce, S. Massey, N. Curtis, G. Smith, C. Olavarría, T. Maugel, *Microscopic, biochemical, and molecular characteristics of the Chilean blob and a comparison with the remains of other sea monsters: nothing but whales.* Biological Bulletin, 206:2004, pp. 125-133.

81 M. Raynal, *Nouvelles donnes sur le monster de Floride de 1896.* Kraken: Archives of Cryptozoology, 2:2009, pp. 3-17.

82 M. Raynal, *Le poulpe colossal des Caraïbes.* Le Clin d'Œil, 16:1987, pp. 21-25.

83 F. L. de la P, Castelnau, Comte de. *On a new Ganoïd fish from Queensland.* Proceedings of the Linnean Society of New South Wales, 3:1879, pp. 164-165

84 G. P. Whitley, *Ompax spatuloides Castelnau, a mythical Australian fish*. American Naturalist, 67:1933, pp. 563-567.

85 T. Dinsdale, *Loch Ness Monster.* London, Routledge and Kegan Paul Ltd: 1976.

86 P. Scott, R. Rines, *Naming the Loch Ness monster*. Nature, 258:1975, pp. 466-468.

anagram of "Yes, both pix are monsters – R".[85] In his annotated cryptid checklist, Heuvelmans proposed that this nomen was synonymous with *Megalotaria longicollis,*[87] although Scott and Rhines had already stated that they saw no reason to believe that the two were conspecific.

The only other lake monsters, which have thus far managed to attract a suggestion for nomina, are 'Champ' of lake Champlain, New York, which was made famous in 1977 when Sandra Mansi photographed an unidentified, serpentine object in the lake. 'Champ' researcher Dennis Hall has suggested that it be given the genus nomen of *Champtanystropheus*, as he believes it to be a living relative of the extinct, semi-aquatic reptilian genus *Tanystropheus* ("Long necked one"), which lived during the Middle Triassic.[88] And 'Cressie' of Crescent Lake in Newfoundland, which has been given the semi-serious nomen of *Cressiteras anguilloida.*[89]

Miscellaneous cryptids

A handful of cryptids that do not fit into either hominology or dracontology have received suggestions for nomina.

Cryptofelids

One of the most notable cryptofelids was the former cryptid known as the King cheetah, which in 1927 was given the nomen *Acinonyx rex* by zoologist Reginald Pocock, who believed it to be a new species of cheetah exhibiting an unusual color patternation to its fur.[90] In 1929 Hungarian taxonomist Miklós Kretzoi went one step further and assigned it the newly created genus nomen *Paracinonyx*.[91] Pocock subsequently retracted his claim citing a lack of evidence; Kretzoi however did not follow suit. The acquisition of skins and the birth of live King cheetahs in captivity has resolved the debate surrounding the taxonomic status of the animal. It has been revealed that the King cheetah is in fact a melanic mutant of *Acinonyx jubatus* Schreber, 1775*,* rather than a new genus, species or subspecies.[92] Other cryptofelids have also received suggestions for nomina, these include the diminutive Caucasian black cat from West Asia, which was granted the nomina *Felis daemon* by the zoologist Konstantin A. Satunin in 1904 on the basis of his examinations of two mounted specimens and skulls that eventually came into the possession of the Leningrad Academy of Sciences.[93] The *Marozi*,

87 B. Heuvelmans, *Annotated checklist of apparently unknown animals with which cryptozoology is concerned.*Cryptozoology, 5:1986, pp. 1-26.

88 D. J. Hall, *Champ Quest, the Ultimate Search: 1999 Field Guide & Almanac for Lake Champlain.* Vermont, Essence of Vermont:1999.

89 G. M. Eberhart, *Mysterious Creatures: A Guide to Cryptozoology.* Connecticut, ABC-CLIO Ltd: 2002.

90 R. I. Pocock, *Description of a new species of cheetah Acinonyx.* Proceedings of the Zoological Society of London, 1:1927, pp. 245-251.

91 M. Kretzoi, *Taxonomiai megjegyzések Paracinonyx n. gen. (generotypus: Acinonyx rex Pocock, 1927).* Felida Tanulmányok, 2 (Aeluroidea-Közlemény):1929, pp. 10-11.

92 L. G. Bottreill, *King Cheetah.* Leiden, Brill Academic: 1987.

93 K. A. Satunin, *The black wild cat of Transcaucasia.* Proceedings of the Zoological Society of London, 74:1904, pp. 162-163.

or spotted lion, was granted the nomen *Panthera leo maculatus* by both Pocock in 1937 and Heuvelmans in 1955[27] who suggested that it was a distinct sub-species of lion adapted for a montane as opposed to a savannah based existence. A single skin of this cryptofelid collected by the Kenyan farmer Michael Trent in 1931 is in the possession of the Natural History Museum of London. And finally the Île du Levant wildcat which was given the nomen *Felis silvestris levantina* by Heuvelmans.[87] This cryptofelid was observed several times in 1958, Heuvelmans himself even reported seeing one attacking feral domestic cats.

Herpetological cryptids

In 1933, naturalist Jakob Nicolussi proposed the nomen *Heloderma europaeum* for the Tatzelwurm, a semi-mythical two-legged, venomous, clawed lizard-like creature said to reside in Central Europe, on the basis of his belief that it belonged to the lizard family Helodermatide.[94] Another herpetological cryptid to be assigned a nomen is the so-called Vietnamese sharp-nosed snake *Cryptophidion annamense*.[95] It was described from photographs of specimens allegedly obtained during the Vietnam War, which were subsequently lost to science. The proposed name has attracted criticism and its current standing within zoology is disputed.[96]

Cryptoavians

Two avian cryptids have been granted nomina. These include Le Gaut's giant white rail, which was observed only once in Mauritius in the 1680's and was given the nomen *Legautia gigantea* in 1858 by the naturalist Hermann Schlegel.[97] And also the enigmatic Double-Banded Argus, which is known from a single primary feather possessing two reddish-brown bands and white dots currently in the possession of the Natural History Museum of London. This cryptoavian was given the nomen *Argusianus bipunctatus* by the naturalist Thomas W. Wood.[98] It is currently considered to be a mutant form of the Great Argus.[99]

94 J. Nicolussi, *Der Tatzelwurm und seine verwandscaft*. Der Schlern, 1933, p. 14.

95 V. Wallach, G. Jones, *Cryptophidion annamense, a new genus and species of cryptozoic snake from Vietnam (Repilia: Serpentes)*. Cryptozoology, 11:1992, pp. 1-37.

96 O. S. G. Pauwels, D. Meirte, *The status of Cryptophidion annamense*, Cryptozoology, 12:1996, pp. 95-100.

97 H. Schlegel, *On some extinct gigantic birds of the Mascarene Islands.* Ibis, 8: 1866, pp. 146-168.

98 WT. W. Wood, Argus bipunctatus*, sp. n., described from a single feather.* Annals & Magazine of Natural History, 4:1871, pp. 67-68.

99 K. S. Parkes, *Review of Distribution and Taxonomy of Birds of the World*. Journal of Ornithology, 63: 1992, pp. 228-235.

Miscellaneous mammalian cryptids

The Andean or Hagenbeck's wolf, which is said to reside in the mountainous regions of South America, was given the nomen *Dasycyon hagenbecki* by the zoologist Ingo von Krumbiegel on the basis of his examination of three skins collected in 1927. [100] [101] Subsequent analysis showed that the pelt belonged to a domestic dog. A 31 cm skull was independently discovered by Krumiegel, and formed part of the basis of his description, however the skull was lost to science during the Second World War.[101] An extinct pink-tusked elephant known only from Chinese ivory carvings dating back to the T'ang dynasty housed in Chicago's field museum has been given the nomen *Elephas maximus rubridens* by the zoologist Paulus E.P. Deraniyagala.[102] A cryptid loris from India possessing a white coat and woolly fur along with a long, bushy tail has been given the nomen *Nycticebus caudatus* by cryptozoologist Karl P. N. Shuker.[103]

A debate has emerged recently over the assignment of the nomen *Pseudonovibos spiralis* to an ethnoknown Asiatic cryptid bovid, the *Kting Voar*. The nomen was first proposed by biologist Wolfgang Peter, and is based on a holotype represented by a set of unusual spiriform horns, that he collected whilst browsing a market place in Ho Chi Minh City.[104] [105]

Much speculation has been made concerning both the affinity of the Kting Voar, and whether or not it actually exists. In the original paper announcing the claim,[104] the authors proposed a taxonomic alliance between the *Kting Voar* and the Antilopini (gazelles), however this was subsequently challenged by a morphological analysis of the holotype, which suggested affinities with the Bovini (cows, buffalo and their allies).[106] [107] [108] An affinity with the Caprini (goat-antelopes) has also been proposed.[109] Genetic studies involving alleged *Kting Voar* specimens have yielded contradictory results,[110] [111] although it has been suggested that this

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100 I. von Krumbiegel, *Der Andenwolf – ein neientdecktes.* Grosstier. Unschau Wiss. Tech*,* 19:1949, pp. 590-591.

101 I. von Krumbiegel, *Der "Andenwolf", Dasycyon hagenbecki (Krumbeigel, 1949).* Saugetierk. Mitt, 1: 1953, pp. 97-104.

102 P. E. P. Deraniyagala, *Some Extinct Elephants and Their Relatives, and the Two Living Species.* Colombo, National Museum of Ceylon: 1955.

103 K. P. N. Shuker, *The Lost Ark: New and Rediscovered Animals of the 20th Century.* London, Harper Collins: 1993.

104 W. P. Peter, A. Feiler, *Horns of an unknown bovid species from Vietnam (Mammalia: Ruminantia).* Faun. Abh. Staatl. Mus Tierkd. Dresden, 19:1994, pp. 247- 253.

105 W. P. Peter, A. Feiler, *A new bovid species from Vietnam and Cambodia Mammalia: Ruminantia).* Zool. Abh. Staatl. Mus Tierkd. Dresden, 48: 1994, pp. 169–176.

106 M. Dioli, *A clarification about the morphology of the horns of the female kouprey: a new unknown bovid species from Cambodia.* Mammalia, 59: 1995, pp. 663–667.

107 M. Dioli, *Notes on the morphology of the horns of a new artiodactyl mammal from Cambodia: Pseudonovibos spiralis* Journal of Zoology, 241: 1997, pp. 527–531.

108 R. M. Timm, J. H. Brandt, *Pseudonovibos spiralis (Artiodactyla: Bovidae): new information on this enigmatic South-East Asian ox.* Journal of Zoology, 253:2001, pp. 157–166.

109 T. Nadler, *Was ist Pseudonovibos spiralis* ? Zool. Garten. N. F., 67:1997, pp. 290–292.

110 S. E. Hammer, F. Suchentrunk, R. Tiedemann, G. B. Hartl, A. Feiler, *Mitochondrial DNA sequence relationships of the newly described enigmatic Vietnamese bovid, Pseudonovibos spiralis* Naturwissenschaften, 86:1999, pp. 279–280.

111 G. V. Kuznetsov, E. E. Kulikov, N. B. Petrov, N. V. Ivanova, A. A. Lomov, M. V. Kholodova, A. B. Poltaraus, *Mitochondrial 12S rDNA sequence relationships suggest that the enigmatic bovid "linh duong" Pseudonovibos spiralis is closely related to buffalo***.** Molecular Phylogenetics & Evolution, 23:2002, pp. 91–94.

may have been due to contamination,[112] [113] The fact that a number of supposed *Kting Voar* horns have turned out to be cattle horns treated in such a way so as to give rise to the unusual spiriform morphology[108] has created problems. References to a *Kting Voar*-like cryptid in Chinese folklore have further complicated the issue,[114] however a consensus seems to be emerging to the effect that the systematic status and taxonomic legitimacy of *Pseudonovibos spiralis* should be treated sceptically until more conclusive evidence of their existence emerges.[115]

Introducing Aequivology – the study of direct and indirect organismal evidences

It is proposed that in order to resolve the ambiguities in the *Code* concerning the assignment of nomina to organisms that are ethnoknown but without an accompanying onomatophore, a new independent but complimentary classificational paradigm should be introduced in the form of the aequivotaxa concept, which is specifically aimed at making provisions for 'cryptids'. Aequivology is the proposed name for a new field within cryptozoology, one that concerns itself with the classification of the direct and indirect evidences pertaining to cryptids.

Naming aequivotaxa

In assigning a cryptid an aequivotaxonomic nomen, a series of preliminary rules have been established which should be used to inform any such attempt at classification. These proposed rules are as follows:

I) That the proposed aequivotaxon be granted a nomen, binomial in form, comprising an aequivogenus and aequivospecies.

II) That the proposed aequivotaxon be supported with respect to a holotype in the form of a detailed description, depiction, photographs, audio recordings, biological samples,ethological traces and other evidences.

III) That the proposed aequivotaxon be supported with a formal description stemming from the holotype, and that attempts to infer organismal affinities be avoided in such descriptions.

112 L. E. Olson, A. Hassanin, *Contamination and chimerism are perpetuating the legend of the snake-eating cow with twisted horns (Pseudonovibos spiralis) : a case study of the pitfalls of ancient DNA.* Molecular Phylogenetics & Evolution, 27:2003, pp. 545-548.

113 A. Hassanin, *Ancient specimens and DNA contamination: a case study from the 12S rRNA gene sequence of the "linh duong" bovid (Pseudonovibos spiralis)* Naturwissenschaften, 89:2002, pp. 107–110.

114 A. A. MacDonald, L. N. Yang, *Chinese sources suggest early knowledge of the "unknown" ungulate Pseudonovibos spiralis from Vietnam and Cambodia.* Journal of Zoology, 241:1997, pp. 523-526.

115 G. J. Galbreath, R. A. Melville, *Pseudonovibos spiralis : epitaph.* Journal of Zoology, 259:2003, pp. 169-170.

IV) That the proposed aequivotaxon be granted a nomen that is non-suggestive of organismal affinities. Ideally, it would derive from the description.

V) That the proposed aequivotaxon be distinct from the biotaxon, in the event that the cryptid is discovered and formally described.

VI) That the proposed aequivotaxon nomen be revocable in the event of the invalidation of the described cryptid or holotype

These six rules are an attempt to establish the groundwork for an objective aequivotaxonomy. As with ichnotaxonomy, a sharp distinction is drawn between descriptions involving the material traces, and the putative organism, which must be subject to different taxonomic rules. Based on the Seilacherian system in ichnology, which assigns ichnotaxa to different classes based on ethologic affinities,[116] [117] it is proposed that a similar six-class system, representing the six major aequivological ethnoknowledge classes of direct and indirect evidence utilized by cryptozoologists in designating and refining research targets; be employed in classification. Also, based on the naming conventions of the Seilacherian system, it is proposed that these aequivological classes be formally known as follows:

I) ***Audaequivia*** are a class of aequivotaxa based upon recorded sound evidence.

II) ***Bioaequivia*** are a class of aequivotaxa based upon biological samples.

III) ***Depictaequivia*** are a class of aequivotaxa based upon both contemporary and ancient cultural and folkloric (ethnozoological and zoomythological) depictions and representations of cryptids.

IV) ***Descriptaequivia*** are a class of aequivotaxa based upon detailed descriptions made from first hand observation.

V) ***Ethoaequivia*** are a class of aequivotaxa based upon ethological traces.

VI) ***Spectaequivia*** are a class of aequivotaxa based upon photographic or cinematographic (seen) evidence.

Aequivotaxa can belong to multiple aequivological classes based on this system. One of its advantages is that the various evidences can be treated objectively instead of speculatively. Much energy is expended in debating the possible zoological affinities of various cryptids; such speculation is peripheral to the task of aequivology however, as it is concerned with the classification of cryptozoological evidences based purely on the properties of those evidences. For example, instead of debating over the exact identity of the Typhonic beast as depicted in Ancient Egyptian reliefs, or the 'Bloop' signal, they can simply be given descriptive nomina

116 A. Seilacher, *Studien zur paläontologie: 1. Über die methoden der palichnologie.* Neues Jahrbuch fur Geologie und Paläontologie. Abhandlungen, 96:1953, pp., 421-452.

117 A. Seilacher, *Sedimentological classification and nomenclature of trace fossils.* Sedimentology, 3:1964, pp. 253-256.

and then assigned to their respective aequivological classes (Depictaequivia and Audaequivia respectively). The existence of a classificational reference frame upon which all researchers can agree will be of considerable benefit to cryptozoology, especially given the history of the field, where the issue of cryptid identity theories has been known to generate much in the way of interpersonal animosity.

A potential aequivotaxonomy of existing cryptid nomina

Only a handful of the nomina presented in the previous sections could feasibly qualify as aequivotaxa, and all are lacking an adequate formal description of their putative holotypes. Most of the proposed nomina are exoplonyms (invalidated taxa) by rule IV, as the nomina make specific assumptions concerning the putative taxonomic affinities of the cryptids that they attempt to describe in instances where such claims to affinity are clearly groundless. A number are also exoplonyms by rule VI, as the cryptid or holotype in question has been invalidated. The nomina that qualify do not make assumptions concerning affinities (rule IV) but may in some cases make claims of analogy regarding appearance (e.g. 'like' a centipede, 'like' an ape, etc). Presented in table 1 is a listing of all of the hoplonyms aequivotaxa nomina along with their aequivological class, synonyms and a description of their putative holotypes (as suggested by this author) :

Table 1: A list of potentially aequivotaxonomically hoplonyms cryptid nomina.

Vernacular name	Nomen	Aequivo-logical class	Synonyms	Proposed holotype	Author(s)
Andean wolf	*Dasycyon hagenbecki*	II	-	Skull described by Krumbiegel in 1949	Krumbiegel (1949)
'Cressie'	*Cressiteras anguilloida*	III, IV	-	Assorted convergent descriptions	?
Five-lined constellation fish	*Bathysidus pentagrammus*	IV	-	Beebe's 1934 description	Beebe (1934)
Great sea centipede	*Mariascolpendra aeliani*	IV	*Cetioscolpendra aeliani**	Tran Van Con's 1883 specimen based description	Woodley (2008)
Kting Voar	*Pseudonovibos spiralis*	II, III, IV	-	Horns recovered from Vietnam and described by Peter and Feiler in 1994	Peter and Feiler (1994a)
Le Gaut's giant rail	*Legautia gigantea*	IV	-	Du Quesne's 1689 description	Schlegel (1858)
Magenta whale	*Amphiptera pacifica*	IV	-	Giglioli's 1870 description	Giglioli (1870)

Many humped sea serpent	*Plurigibbosus novaeangliae*	III, IV	*Scoliophis atlanticus*†; *Megophias monstrosus;* *Pelamis megophias*;* *Zeuglodon plesiosauroides*;* *Megophias megophias*	Thomas Perkins's 1817 description	Heuvelmans (1965)
Merhorse	*Halshippus olaimagni*	III, IV, VI	*Octipos (?) coccineus;* *Octipos bicolor;* *Cadborosaurus willsi*;* *Cadborotherium willsi**	1937 Naden Harbour carcass photographs	Heuvelmans (1965)
Rhinoceros dolphin	*Cetodipterus* (?) *rhinoceros*	III, IV	*Oxypterus mongitori*†; *Delphinus rhinoceros**	Quoy and Gaimard's 1824 description	Raynal and Sylvestre (1991)
Sasquatch	*Anthropoidipes ameriborealis*	I, III, IV, V, VI	*Gigantopithecus blacki*;* *Gigantopithecus canadensis*;* *Gigantanthropus*;* *Australopithecus robustus*;* *Australopithecus canadensis*;* *Paranthropus eldurrelli**	Set of footprint casts reposited at National Museum of Natural History, Smithsonian Institution and the Titmus Collection at the Willow Creek China Flats Museum, California, described by Meldrum in 2007	Meldrum (2007)
Vietnamese sharp nosed snake	*Cryptophidion annamense*	IV, VI	-	Vietnam war era Photographs described by Wallach and Jones in 1992	Wallach and Jones (1992)

Note: *Nomina are exoplonyms in violation of rule IV.
†Nomen is exoplonyms by rule VI.

Table 1 is of course not representative of the full potential variety of cryptids for which there exist direct and indirect evidences in one or more of the aequivological classes.[87] [118] In some cases it is apparent that there exists more than one potentially hoplonyms nomen for a particular cryptid. The choice of lead nomen in these instances is somewhat subjective and reflects the author's preferences. Hoplonyms nomina should ideally be purely descriptive of the holotype. As a consequence of this, new replacement nomina might therefore be proposed for these cryptids that are more objective in this sense.

The proposed task of aequivology is to ultimately categorize and describe the full breadth of this diversity in such a way as to allow for rigorous technical appraisal.

Finally, it must be noted that this is not the first cryptozoological classification system to employ numerical categorization. Cryptozoologist J. Richard Greenwell[11] developed a comprehensive system comprising seven categories, five of which are explicitly cryptozoological in that they encompass claims that are both currently unresolved and for which historical precedent exists demonstrating that similar such claims, whilst unlikely, proved to be correct in the past. These categories include criteria such as extant and well-known taxa unrecognized as existing in certain geographic locales owing to inconclusive evidence (Category II), and new taxa of known, extant forms for which there exists no known organic evidence (Category VI). The aequivological class system by contrast differs markedly from Greenwell's classificatory categories in that its purpose is specifically to resolve nomenclatural ambiguities in addition to which it groups cryptids based on the sorts of evidences that accompany claims rather than on the basis of the putative characteristics of the cryptids. Whilst Greenwell's classificatory categories could operate in parallel with the aequivotaxa system, Greenwell's system suffers from problems of subjectivity. For example, Greenwell lists the claim that there exist extant plesiosaurs in Scotland as an example of a Category V claim (p. 5). Category V includes representatives of fossil forms believed to have become extinct during geological times, but which may have survived into historical or present times. The idea that 'Nessie' is an extant plesiosaur represents just one claim concerning its putative identity[86]. Heuvelmans[87] for example suggested that 'Nessie' might be associated with his 'long-necked' pinniped type sea serpent (*Megalotaria longicollis*). Mackal[119] has also suggested that it might be a large amphibian. These claims would belong to a different category (Category VI), which is obviously problematic as there are many claims concerning the putative affinities and identities of cryptids, which in practice would result in Greenwell's classificatory scheme becoming massively inflated with lists of claims possessing no real commonalities even when they concern a single cryptid. The aequivotaxa system overcomes this problem by only classifying cryptids based on the sorts of evidence accompanying them. This has the advantage of making cryptozoological classification much more manageable, objective and ultimately coherent.

118 K. P. N. Shuker, *A supplement to Dr Bernard Heuvelmans' checklist of cryptozoological animals.* Fortean Studies, 5:1998, pp. 208-229.

119 R. P. Mackal, *The Monsters of Loch Ness.* London, Futura Publications Limited: 1976.

Conclusions

What would necessarily be the problem with simply tightening the wording of the *Code* so as to explicitly exclude these ambiguous nomina as hypothetical concepts or as lacking an onomatophore, as Dubois and Nemésio [5] have suggested? Why go to the lengths of developing an alternative taxonomy for them? There are two answers to these questions. On the one hand, intrinsic to cryptozoology is the aforementioned need for a rational classification system, one that eschews speculation and classes the evidence based on its objective qualities so as to aid in the technical appraisal of the subjects of the field. On the other hand, extrinsic to cryptozoology is the broader philosophical implications of a *Code* which *de facto* relegates animals ethnoknown through direct and indirect forms of evidence to non-existence, especially when there exists precedent for such evidences leading to the successful identification of new taxa – which was the primary fear of Heuvelmans [13] when he lamented the 1958 decision of the ICZN to reject More and Sylvester-Bradley's parataxa proposal. Ideally, the *Code* should be less positivist and more agnostic with respect to so called 'hypothetical species', however this agnosticism must be objective. The development of ichnotaxonomy into a viable system for classifying ethologic traces – where there is no evidence of an organism *per se* merely its works, should make it apparent that such agnosticism can be objective, as by treating the trace maker and trace as separate entities, taxonomic stability is not compromised by the subjective matching of a species to a trace. The development of aequivotaxonomy should allow for current cryptid nomina that have ambiguous zoological standing to be incorporated into a viable parallel classificational framework, one which simultaneously clarifies the ambiguities surrounding the standing of these nomina and aids in efforts at technically appraising cryptids without compromising taxonomic stability.

A final issue in need of discussion is regulation. The ICZN and other nomenclatural regulatory bodies function to control the proliferation of binomial names through the establishment of rules consented to (in theory) by all workers. A similar entity should exist for the regulation of aequivotaxa. It is proposed that the Department of Cryptozoology Bernard Heuvelmans at the Musée Cantonal de Zoologie in Lausanne, Switzerland is ideally situated to assume this role as holder of Bernard Heuvelmans' archives. An 'international commission on aequivological nomenclature' would represent a major step towards the establishment of cryptozoology as a formal discipline.

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